

Claims

1. An impurity introducing method, including
a first plasma irradiation step of carrying out plasma
irradiation for realization of amorphous in which a surface of
5 a semiconductor substrate is changed to an amorphous situation,
and a second plasma irradiation step of carrying out plasma doping
impurities so as to form a shallow junction in the semiconductor
substrate, and

including a resetting step of resetting a plasma
10 irradiation condition, on the occasion of shifting from the first
plasma irradiation step to the second plasma irradiation step.

2. The impurity introducing method as set forth in Claim 1,
wherein the resetting step includes a step of resetting an initial
15 condition of a plasma generation source so as to adapt to plasma
which is used in each step.

3. The impurity introducing method as set forth in Claim 1
or 2, wherein the resetting step includes a step of resetting
20 an initial condition of a matching point of a matching circuit
so as to adapt to plasma which is used in each step.

4. The impurity introducing method as set forth in any one
of Claims 1 through 3, wherein the resetting step includes a
25 step of stopping electric discharge once and then, resetting

it, on the occasion of shifting from the first plasma irradiation step to the second plasma irradiation step.

5. The impurity introducing method as set forth in any one
5 of Claims 1 through 3, wherein the resetting step includes a
step of decreasing and changing bias power and thereafter,
applying desired bias power, on the occasion of shifting from
the first plasma irradiation step to the second plasma
irradiation step.

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6. The impurity introducing method as set forth in any one
of Claims 1 through 3, wherein the resetting step includes a
step includes one of increasing pressure and changing other
conditions except pressure, and thereafter, setting desired
15 pressure, on the occasion of shifting from the first plasma
irradiation step to the second plasma irradiation step.

7. The impurity introducing method as set forth in any one
of Claims 1 through 6, characterized in that the second plasma
20 irradiation step is carried out after the first plasma
irradiation step.

8. The impurity introducing method a set forth in Claim 7,
wherein it is configured in such a manner that the first plasma
25 irradiation step is carried out after the second plasma

irradiation step.

9. The impurity introducing method as set forth in any one
of Claims 1 through 6, wherein it is configured in such a manner
5 that the first plasma irradiation step is carried out prior to
the second plasma irradiation step.

10. The impurity introducing method as set forth in any one
of Claims 1 through 9, characterized in that gas seed, which
10 is used in the fist plasma irradiation step, includes helium
and neon.

11. The impurity introducing method as set forth in any one
of Claims 1 through 9, wherein gas seed, which is used in the
15 second plasma irradiation step, includes at least one of a group
comprising Ar, Kr, Xe, and Rn.